

THE DEATH FEINT OF DIPLLOTAXUS LIBERTA GERM.

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The following notes relate to the death feint of *Dipllotaxus liberta*, a small, oblong convex, photonegative, lamellicorn beetle found beneath stones, bark, logs, etc., usually in dry places. The death feints were induced by picking up the beetle and dropping it five or six inches or by touching its ventral thoracic surface with the point of a pencil. As a rule the antennæ and legs were not drawn close to the body during the death feint, but when specimens were roughly handled these appendages in some cases were withdrawn close to the ventral surface. Successive

TABLE I

Beetle	Temperature F.	Number of successive death feints.	Range in duration of death feints (seconds).
A	78°	62	1- 65
B	78°	49	5-135
C	78°	51	3- 75
D	78°	67	3- 70
E	88°	33	3- 85
F	88°	41	2- 75
G	88°	41	2- 12
H	88°	36	2- 56

stimuli were applied to four beetles at a temperature of 78° F., and to four other beetles at a temperature of 88° F., and their reactions noted. There was a great variation in the duration of the death feints probably due in part to the variations in the force of the stimulus. Manual stimulation is unsatisfactory in this respect. It is difficult to apply each stimulus with equal force. A puff of air which could be regulated mechanically would have been more satisfactory, but even under this condition there would be variations due to differences in the sensitivity and conductivity of the protoplasm of nerve tissue at different times. The results of these successive stimuli, therefore, should be con-

sidered as a sort of rough approximation of the behavior of the beetles.

As shown in Table I, although the range in the duration of the death feints was great whether the temperature was 78° F., or 88° F., the number of successive death feints that could be initiated at 88° F., was much smaller than when the temperature was 78° F. The number of successive death feints is equal to the number of stimuli, at the end of which the beetles failed to react.

The average duration of all successive death feints for each beetle is shown in Table II. The differences between the average duration periods at temperatures of 78° and 88° F., are not as significant as the differences between the total durations at 78° and 88° F. Nevertheless the averages at 78° F., are higher than at 88° F. As would be expected the total duration of the successive death feints was much greater at a temperature of 78° F.

TABLE II

Beetle	Temperature F.	Number of successive death feints.	Total duration of successive death feints (seconds).	Average duration of all successive death feints (seconds).
A	78°	62	1,017	16
B	78°	49	1,124	23
C	78°	51	595	12
D	78°	67	1,403	21
E	88°	33	301	9
F	88°	41	591	14
G	88°	41	281	7
H	88°	36	487	14

The average duration of each group of five successive death feints, in seconds, for each beetle at temperatures of 78° F., and 88° F., is found in Table III. The last figure in each column represents the average of a number slightly less than or slightly in excess of five. In all cases there is a more or less uneven decline in the average and at 88° F., as opposed to 78° F., the average at the end is smaller and is reached after a lesser number of death feints.

It is realized that the number of beetles tested was small, nevertheless the reactions of this small number indicate the ability of

the insects to recover from fatigue each time, after a number of successive stimuli, much better at a temperature of 78° F., than

TABLE III

A 78° F.	B 78° F.	C 78° F.	D 78° F.	E 88° F.	F 88° F.	G 88° F.	H 88° F.
33	33	43	27	29	25	9	43
20	42	12	51	10	33	9	22
33	54	9	28	7	25	8	7
27	32	12	35	6	10	7	8
11	11	6	14	4	11	7	7
13	18	5	27	3	5	8	7
7	7	7	18		4	5	4
10	5	10	12		5	3	
13	14	6	11				
10	10	5	16				
11			14				
11			13				
			9				

at 88° F. After each stimulus the reaction of feigning death involves a destructive chemical action in the nerve tissue involved. The restoration of the decomposed substances took place more effectively or more slowly at 78° F., than at 88° F. At a temperature of 88° F., the beetles were more active, the average duration period of the death feint (recovery period) was smaller and the number and total duration of successive death feints declined. High temperatures hasten recovery but apparently the chemical processes necessary for a successively large number of recoveries are impaired. The insect becomes too excitable to react as it did under a lower temperature.